1135-03-2618 **Joshua A. Cole*** (colej@wabash.edu). *The Two Quantifier Theory of the Effectively Closed Muchnik Degrees.* Preliminary report.

Over the past 15-20 years, many computability theorists have studied the Π^0_1 subsets of $2^{\mathbb{N}}$ as mass problems. Under both Medvedev (strong) and Muchnik (weak) reducibility, a corresponding lattice structure arises (these are denoted by $\mathcal{E}_s$ and $\mathcal{E}_w$, respectively). In addition to being natural objects of mathematical interest, these lattices are important to computability theory and provide insight into the foundations of mathematics. It is natural (especially in computability theory) to ask questions about the structure of such objects, such as whether these lattices are dense. In turns out both lattices are dense, Binns, Shore, and Simpson having recently shown the density of $\mathcal{E}_w$.

Adding new techniques to the priority argument used to prove the density of $\mathcal{E}_w$, we show that its $\forall\exists$-theory in the language of partial orders is decidable. In fact, we show that $\mathcal{E}_w$ and $\mathcal{E}_s$ have the same $\forall\exists$-theory (in the language of partial orders). In our proof we also use many of the ideas (including solving the multi-extension of embeddings problem) used by Cole and Kihara (independently) for deciding the $\forall\exists$-theory of $\mathcal{E}_s$. (Received September 26, 2017)